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Buprestidae

LONGEVITY OF TWO SPECIES OF BUPRESTIS [1/]

For half a century entomologists have speculated upon the length of life of Buprestis aurulenta L., commonly called the golden buprestid, a native woodborer widely distributed in western North America. Circumstantial evidence has indicated that individual larvae live in air-dry wood 10, 20, 30, even up to 50 years. This evidence consists of records of living larvae and adults from wood in use for known periods of time. Buprestis langi (Mann.) has been similarly recorded.

Today, I can report without qualification that some larvae of B. aurulenta live 23 years in air-dry wood and B. langi 22 years. The indications are that both may take very much longer to mature in such material. Before presenting the evidence on longevity, I will comment briefly on some habits of these insects and on methods of rearing them.

Several species of Buprestis are native to Oregon and Washington, the States to which my comments apply. Two of these species, B. aurulenta and B. langi, commonly emerge from Douglas-fir lumber in houses and other structures long after construction, B. aurulenta being the more prevalent. In the city of Portland, Oreg., alone, hundreds of houses infested by these insects have been reported. The beetles emerge from practically all parts of a house, inside and out. Usually the damage to buildings is slight and control impractical, but some wooden storage tanks have been seriously damaged.

1/ Paper by R. L. Furniss, Entomologist, Pacific Northwest Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture, given at annual meeting of the Entomological Society of America in Phoenix, Ariz., December 3-6, 1962.

Entomologists have assumed that in most cases of infested buildings the beetle larvae were in the wood at the time of construction. It has been speculated that in some cases eggs were laid in buildings after construction and that there might be reinfestation by successive generations.

In 1939, a small-scale study was undertaken at La Grande, Wash., to find out how long B. aurulenta and B. langi actually live in air-dry Douglas-fir lumber. Today, I am making a progress report. I suspect that someone else will have to make the final report, for these insects live a very long time in dry wood. The end is not in sight.

During this study adults of both species frequently were observed to lay eggs in stacks of newly sawn lumber. A few times, both species were observed to lay eggs in weather-checked lumber in wooden structures, specifically water tanks. In one instance, adults of B. langi were observed to emerge in a house from lumber with surface marks clearly showing that it was infested prior to the time it was sawn. These observations indicate that many infestations in buildings originate in lumber subsequent to milling and prior to construction; that some come from infested lumber cut from injured and dead trees; and that some develop subsequent to construction. As yet there is no authenticated case of reinfestation inside a building.

For the rearing study, females were captured in lumberyards and taken to the laboratory to obtain eggs. Some laid eggs without special treatment; however, better results were obtained when they were fed. B. aurulenta fed upon Douglas-fir foliage and B. langi upon alder and willow. After the beetles had fed from one to several days, they were placed individually in small glass jars containing several thin splints of Douglas-fir wood bound together. The jars were kept warm under desk lamps. The beetles laid their eggs in cracks between the splints. Egg laying took place both in full light and complete darkness.

The eggs hatched in about one month. Since the splints of wood were very thin, the larvae soon bored through them and dropped to the bottom of the jars where they were collected. Then they were individually introduced into blocks of seasoned Douglas-fir, mostly heartwood, about 1/2 by 3 by 4 inches. These isolations were made from 1939 to 1942. Periodically since then the blocks have been cut open and the surviving larvae measured and re-introduced into new blocks of the same age. Some remeasurements were made in November 1962.

Some of the infested blocks of wood have been stored indoors continuously; sometimes in heated buildings and sometimes not. Others have been stored outdoors, sometimes under a roof and sometimes in screen cages exposed to the elements. Thus, conditions have been so varied that no valid conclusions can be drawn regarding effects of different treatments upon larval survival and rate of development.

In 1954, when the last complete reexamination was made, 48 of the original 850 larvae were alive. Forty of them were B. aurulenta and eight were B. langi. Quite obviously B. aurulenta has done better under the conditions of the study. It has developed more rapidly, or perhaps less slowly, and it has survived better than B. langi. Since 1954 further mortality has occurred but the exact amount has not been determined. Some larvae of both species are still alive.

The oldest B. aurulenta in this study are larvae that developed from eggs laid in July 1939. Some of them were still alive and active late in November 1962 at the age of 23 years. The oldest B. langi is one that developed from an egg laid in July 1940. At the age of 22 years it, too, was alive and active in November 1962. The largest of the survivors of both species are about two-thirds grown and the smallest are perhaps one-quarter grown, hence all still have prospects of many years of life ahead.

Newly formed first instar larvaeare about 2-1/2 mm. long and mature larvae about 35 mm. At the end of 15 years many of the larvae in this study were only 3 to 5 mm. long; a few had attained 25 mm., the maximum length recorded to date. Over long periods some larvae have not gained in body size; some have even decreased. For example, one B. aurulenta larva that was 13 mm. long in 1954 was only 9 mm. long in 1962, though apparently still in good vigor. These variations and fluctuations in development are attributed to undetermined differences in the food value of the rearing blocks.

In 1942, several large larvae, probably B. aurulenta, were collected in the wild and introduced into blocks in the same manner as for small larvae. Although none survived to maturity, they lived for varying times up to 12 or more years, ample to indicate that large larvae may be handled in this manner.

Observations also were made on Buprestis rusticorum (Kby.). That species laid its eggs only under bark and would not become established in sawn lumber. We have no record of its emerging in houses.

What can we conclude from all this? First, we have two likely candidates for the title, "Methuselah of the Insect World." Second, we have two wood-boring insects that can be studied in the laboratory in much the same fashion as the old-house borer, Hylotrupes bajulus (L.). They offer opportunities for a variety of studies, especially nutritional.